

WE CLAIM:

1. A bone plate for fusing at least two bones of a hand or foot, comprising:

(A) a body portion having a convex, at least substantially hemi-spherical bone-

5 facing surface; and

(B) at least two openings defined by the body portion, the openings being configured to receive bone screws that attach the plate to each of the at least two bones and pull the bones together.

10 2. The bone plate of claim 1, the body portion defining at least three openings, wherein the openings are configured to receive bone screws that attach the plate to each of at least three bones and pull the bones together.

15 3. The bone plate of claim 1, wherein the bone-facing surface corresponds to less than half of a sphere.

4. The bone plate of claim 1, wherein the bone plate is formed of a biocompatible material.

20 5. The bone plate of claim 1, the body portion defining a central axis, the openings being oriented so that the bones are compressed generally toward the central axis when the bone screws attach the plate to the bones.

6. The bone plate of claim 1, wherein the body portion includes a central region and a projection disposed at the central region and projecting from the bone-facing surface.

5 7. The bone plate of claim 6, wherein the post is configured to be removable from the body portion.

8. A method of fusing at least two bones, comprising:
selecting a bone plate according to claim 1;
10 forming a recess in the at least two bones capable of receiving the bone plate;
positioning the bone plate in the recess, such that the bone-facing surface of the bone plate adjoins the at least two bones; and
joining the bone plate to the at least two bones using bone screws.

9. A bone plate for fusing at least two bones of a hand or foot, the at least two bones defining a recess and a hole that extends into bone from the recess, the bone plate comprising:

(A) a body portion configured to be received at least substantially in the recess, the body portion including a central region and an outer region at least partially surrounding the central region, the outer region including a convex bone-facing surface;

(B) at least two openings disposed in the outer region of the body portion, the openings being configured to receive bone screws that attach the bone plate to the at least two bones; and

(C) a projection extending from the central region of the body portion, beyond the bone-facing surface, the projection being configured to be received in the hole, thereby restricting movement of the body portion.

10. The bone plate of claim 9, wherein the openings further are configured such that the bone screws pull the bones generally toward the central region.

11. The bone plate of claim 9, wherein the projection is configured to restrict movement of the body portion tangential to the bone-facing surface of the outer region.

12. The bone plate of claim 9, the body portion and the projection each define a central axis, wherein the central axes are at least substantially aligned.

13. The bone plate of claim 9, wherein the bone-facing surface of the outer region is one of at least substantially hemi-spherical and at least substantially conical.

14. The bone plate of claim 9, wherein the projection comprises a separate
5 component that is removable from the body portion.

15. The bone plate of claim 9, the central region of the body portion defining an aperture, wherein the projection is configured to be attached to the body portion at the aperture.

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16. The bone plate of claim 9, wherein the projection and the body portion are configured for threadable engagement.

17. The bone plate of claim 9, wherein the projection is formed unitarily with
15 the body portion.

18. The bone plate of claim 9, the body portion further including a perimeter and a bone-opposing surface that opposes the bone-facing surface, wherein the thickness of the perimeter is greater than the average thickness of the body portion
20 measured between the bone-facing and bone-opposing surfaces.

19. A method of fusing at least two bones, comprising:

selecting a bone plate according to claim 9;

forming a recess in at least one of the at least two bones capable of receiving the body portion of the bone plate;

5 forming a hole in at least one of the at least two bones capable of receiving the projection of the bone plate;

positioning the bone plate in the recess and the hole, such that the bone-facing surface of the body portion and the projection both adjoin the at least two bones; and

joining the bone plate to the at least two bones using bone screws.

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20. A bone plate for fusing at least two bones of a hand or foot, comprising:

(A) a body portion defining a central axis and having a convex bone-facing surface; and

(B) at least two openings defined by the body portion, the openings being
15 configured to receive bone screws that attach the plate to each of the at least two bones and pull the bones together generally toward the central axis, at least one of the openings being a slot.

21. The bone plate of claim 20, wherein the slot is arcuate when viewed
20 generally normal to the slot.

22. The bone plate of claim 20, the body portion having a perimeter, wherein the slot extends partially around the central axis and generally parallel to the perimeter.

23. The bone plate of claim 20, wherein the slot extends toward the central
5 axis.

24. The bone plate of claim 23, wherein the slot is a compression slot with a tapered counterbore.

10 25. The bone plate of claim 20, there being at least three openings defined by the body portion, wherein at least of the openings is at least substantially circular, and at least another two of the openings are slots.

26. The bone plate of claim 25, the at least two bones being at least three
15 bones, wherein the at least three openings are disposed so that the plate can be fastened first to one of the bones using the circular opening, and next to at least two other bones at variable positions using the slots.

27. The bone plate of claim 20, the body portion defining an edge of the slot,
20 wherein the edge is scalloped to form plural discrete sites, each of the discrete sites being configured to receive one bone screw.

28. The bone plate of claim 27, wherein the edge defines a counterbore for each of the discrete sites.

29. The bone plate of claim 20, the body portion defining at least three openings, wherein the openings are configured to receive bone screws that attach the plate to each of at least three bones and pull the bones together generally toward the central axis.

30. The bone plate of claim 20, wherein the bone-facing surface is one of at least substantially hemi-spherical and at least substantially conical.

31. The bone plate of claim 20, wherein at least a portion of the bone-facing surface has a rough texture.

32. A method of fusing at least two bones, comprising:
selecting a bone plate according to claim 20;
forming a recess in the at least two bones capable of receiving the bone plate;
positioning the bone plate in the recess, such that the bone-facing surface of the bone plate adjoins bone; and
joining the bone plate to the at least two bones using bone screws.

33. A bone plate for fusing plural bones that define a recess, comprising:

(A) a body portion configured to be received in the recess, wherein the body portion includes a bone-facing surface and a bone-opposing surface that opposes the bone-facing surface, the bone-facing surface being convex and being configured to
5 adjoin at least one of the plural bones in the recess, and wherein the body portion defines plural openings, the plural openings extending between the bone-facing and bone-opposing surfaces, the plural openings being configured to receive bone fasteners that attach the body portion to the plural bones; and

(B) a cap configured to be coupled to the body portion and configured to obstruct
10 out-of-bone movement of at least one of the bone fasteners after the at least one bone fastener has attached the body portion to at least one of the plural bones.

34. The bone plate of claim 33, wherein the plural openings further are configured to receive bone fasteners that compress the plural bones radially.

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35. The bone plate of claim 33, wherein the cap is configured to be threadably engaged with the body portion.

36. The bone plate of claim 33, wherein the cap has a blocking portion
20 configured to contact a head portion of the at least one bone fastener before the at least one bone fastener moves completely out of bone.

37. The bone plate of claim 33, the cap having a threaded portion joined to the blocking portion, wherein the threaded portion is configured to couple the cap to the body portion, the blocking portion and threaded portion each having a diameter, the diameter of the blocking portion being greater than the diameter of the threaded portion.

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38. The bone plate of claim 33, the body portion having a central region, the central region defining a hole, wherein the cap is configured to be received in the hole from the bone-opposing surface to couple the cap to the body portion.

10 39. The bone plate of claim 33, the cap being configured to obstruct out-of-bone movement for each of the bone fasteners.

40. A method of fusing at least two bones, comprising:

selecting a bone plate according claim 32;

15 forming a recess in the at least two bones capable of receiving the bone plate;

positioning the bone plate in the recess, such that the bone-facing surface of the bone plate adjoins the at least two bones;

joining the bone plate to the at least two bones using bone screws; and

20 affixing the cap to the bone plate, such that out-of-bone movement of at least one of the bone screws is obstructed.